

REMARKS

Applicants respectfully request further examination and reconsideration in view of the above amendments and arguments set forth fully below. Claims 2-15, 17 and 19-24 were previously pending. Claims 21 and 23 are currently amended.

Summary of Applicant's Invention

The claimed subject matter pertains to printing systems used to print images on substrates.

The printing systems include a transport belt that moves a substrate through the printing system, and a vacuum table that holds the substrate on the transport belt. In prior art vacuum table printing systems, the amount of required vacuum can vary significantly based on the portion of the vacuum table covered by the substrate. Some prior art printing systems have addressed this issue using complicated vacuum systems. The claimed invention, in contrast, addresses this issue without requiring complicated vacuum systems.

Independent claims 21 and 23 claim apparatus and corresponding methods for transporting a substrate 32 through a printing system 10. In particular, claim 21 recites an apparatus that includes a vacuum table 22, a moveable transport belt 18 and a substantially flat porous sheet 43 disposed between a top surface of the vacuum table and the transport belt. (Page 5, lines 3-13; page 6, lines 6-7, 13-15 and 20-21; FIGS. 1, 2A, 2B and 3A). The vacuum table has a substantially flat top surface and a plurality of holes 21 that are in fluid communication with a vacuum source 42 located within the vacuum table. (Page 6, lines 7-9; FIG. 2A). The moveable transport belt 18 includes holes 100 extending through a thickness of the belt. (Page 6, lines 13-15; FIG. 2B). The porous sheet 43 restricts fluid flow between the vacuum table 22 and the transport belt 18. (Page 6, line 24 through page 7, line 1).

Because porous sheet 43 acts as a flow restrictor, vacuum table 22 can provide a continuous vacuum, even if the portion of transport belt 18 covered by the substrate 32 varies. (Page 6, lines 24-27). Thus, with porous sheet 43, no further adjustment to the vacuum level needs to be made as one or more substrates 32 are transmitted through the printing system during the print process. (Page 6, line 27 through page 7, line 1).

Rejections Under 35 U.S.C. § 102

Within the Office Action dated August 6, 2008, the Examiner rejected claims 19-21 and 23 under 35 U.S.C. § 102(e) as being anticipated by United States Patent No.: 6,336,722 to Wotton et al. (hereinafter referred to as "Wotton"). The Applicants respectfully traverse this rejection. The Manual of Patent Examining Procedure states that "To anticipate a claim, the reference must teach every element of the claim". (MPEP § 2131). Furthermore, it states that "A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987).

The Applicant contends that the cited prior art reference used to reject the Applicant's claimed invention do not teach each element of the claims. Specifically, Wotton does not teach "a substantially flat porous sheet disposed between the top surface of the vacuum table and the transport belt and in contact upon the substantially flat top surface of the vacuum table" and "wherein the porous sheet continuously restricts fluid flow between the table and the transport belt, such that the vacuum level provided by the vacuum table does not have to be readjusted as an area of the transport belt covered by the substrate varies."

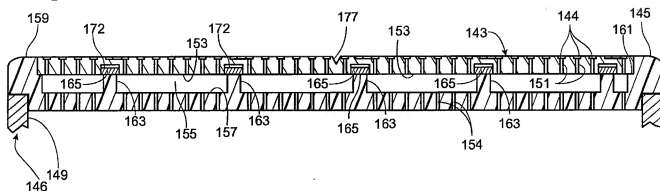
On the contrary, the Applicant's disclosure teaches this limitation explicitly. Furthermore, this limitation provides an important improvement over the prior art, including Wotton. The limitation is disclosed throughout the Applicant's specification, figures and the claims and is specifically taught at Page 5, line 11 through Page 9, line 6. A relevant portion of this section includes the following teaching:

"A porous sheet 43 having a thickness of about 0.5 inch sits between the vacuum table 22 and the transport belt 18. The porous sheet is made from a sintered, porous polyethylene, or any other suitable material. The holes in the belt 18, and the porous sheet 43 assure that a suction is applied to a substrate when a vacuum is provided by the vacuum table 22. In essence, the porous sheet 43 acts as a flow resistor. Thus when the substrate covers only a portion of belt 18, the vacuum provided by the vacuum table 22 does not have to be significantly readjusted, if at all, even as the area over the belt covered by the substrate varies. In sum, with the porous sheet 43, a continuous vacuum can be provided by the vacuum table 22, and no further adjustment to the vacuum level needs to be made as one or more substrates are transmitted through the printing system during the print process. This feature is applicable to both continuous substrates, for example, those supplied from a roll, as well as non-continuous substrates such as a flexible or a rigid sheet supplied individually."

On the other hand, Wotton does not teach "a substantially flat porous sheet disposed between the top surface of the vacuum table and the transport belt and in contact upon the substantially flat top surface of the vacuum table" and "wherein the porous sheet continuously restricts fluid flow between the table and the transport belt, such that the vacuum level provided by the vacuum table does not have to be readjusted as an area of the transport belt covered by the substrate varies."

The portion of Wotton previously cited by the Examiner refers specifically to Figures 6 and 7 of the reference. Figure 7, shown below, succinctly illustrates why the Examiner's logic is misguided and the above limitations are not taught in Wotton, either explicitly or inherently.

Fig. 7



Legend

- 143 – Top Plate
- 144 – Ports
- 145 – Bottom Plate
- 146 – Vacuum Box
- 149 – Body
- 151 – Apertures
- 153 – Underside
- 154 – Apertures
- 155 – Air Space
- 157 – Otherwise Flat Upper Surface
- 159 – Peripheral Frame
- 161 – Groove
- 163 – Support Posts
- 165 – Elongated Substrate
- 172 – Heating Elements
- 177 – Notch

Wotton Does Not Teach A Substantially Flat Porous Sheet In Contact Upon The Substantially Flat Top Surface Of The Vacuum Table

The Applicant disagrees with the Examiner's assertion that the "Bottom Plate 145" of Wotton comprises "a substantially flat top surface of the vacuum table" and also that "top plate 143" comprises a "substantially flat porous sheet". However, for the sake of argument, the Applicant will show that even if the "Bottom Plate 145" of Wotton comprises "a substantially flat top surface of the vacuum table" and "top plate 143" comprises a "substantially flat porous sheet", Wotton does not teach the "a substantially flat porous sheet in contact upon" the "substantially flat top surface of the vacuum table".

As shown in Figure 7, and consistently taught throughout Wotton, a series of "support posts 163" are disposed between the "bottom plate 145" and the "top plate 143". Furthermore, the support posts are crucial to the heating system aspect of Wotton.

On the other hand, the Applicant's claimed invention requires that the substantially flat porous sheet be in contact upon the substantially flat top surface of the vacuum table. Indeed, this limitation helps achieve the flow resistance aspect of the invention.

Since Wotton does not teach this limitation, the Examiner's rejection based on anticipation by Wotton may not be upheld.

Wotton Does Not Teach Continuous Fluid Flow Resistance

Additionally, upon a more careful inspection of Wotton, it will become clear that the top plate does not restrict fluid flow between the table (vacuum box) and the transport belt. The Examiner claims that fluid flow is restricted because "the total area of the apertures 151 in the top plate is smaller than the open area without the top plate 143." While the Applicant generally agrees that the total area of the apertures 151 is smaller than the open

area of the "air space 155", it is clear that the total area of the apertures 151 is **identical** to the total area of the apertures 154 of the bottom plate 145. This means that fluid flow may be restricted between the air space 155 and the transport belt for a mere instant while pressure equilibrium is established in the air space 155. However, as stated in Wotton, the "bottom plate 145 also includes through apertures 154 that are axially aligned with the apertures [151] in the top plate 143. As a result, the vacuum pressure developed in the vacuum box 149 is communicated through the bottom plate apertures 154, through the air space 155, through the top plate apertures 151 to the ports 144 on the surface of the platen. Thus, the uniform distribution of vacuum pressure is present across the platen support surface." (Col. 9, lines 60-67).

The Examiner contends that the top plate "inherently restricts fluid flow", however a closer inspection reveals otherwise. For instance, if the body 149 were extended to show the vacuum box, the reader would more readily appreciate that the air flow would be the same at apertures 151 and apertures 154 once equilibrium is established across the air space 155. For at least this reason, it is clear that the top plate does not "continuously restrict fluid flow between the table and the transport belt", as required by claim 21.

Indeed, the differences between Wotton and the Applicant's invention are material to the objects of the Applicant's invention. Therefore, it is extremely relevant that Wotton does not teach these limitations. For example, it is an object of the invention to provide continuous uniform suction to a substrate as the transport belt moves the substrate into position beneath the printing cartridge. It is also another object of the invention to provide a printing environment which accommodates substrates of varying size and shape. Therefore, there was a need to provide a vacuum system that provides suction to varying sized substrates without having to continuously adjust the level of suction. This need has been addressed by the inclusion of the porous sheet positioned between the vacuum table and the transport belt.

As explained above, Wotton clearly does not teach a porous sheet used as a flow resistor. For at least this reason, the Examiner has not adequately shown that Wotton teaches each and every element of the claims as required by MPEP § 2131. Specifically, Wotton does not teach all the limitations present in independent claims 21 and 23 nor in claims 2-15, 17, 19, 20, and 22 which incorporate claims 21 by references. For this reason the Examiner's rejection based on anticipation may not be properly maintained.

Claims Rejections under 35 U.S.C. § 103

Also within the Office Action, the Examiner rejected claims 22 and 24 under 35 U.S.C. § 103(a) as being unpatentable over Wotton in view of United States Patent No.: 5,806,992 to Ju (hereinafter referred to as "Ju"). The Examiner rejected claims 2 and 17 under 35 U.S.C. 103(a) as being unpatentable over Wotton in view of United Patent No.: 6,409,332 to Yraceburu et al. (hereinafter referred to as "Yraceburu"). The Examiner also rejected claims 3-15 under 35 U.S.C. § 103(a) as being anticipated by Wotton in view of the Examiner's Official Notice.

The Applicants respectfully traverse these rejections because neither Wotton, Ju or Yraceburu contain all the limitations present in the Applicant's present invention. Specifically, none of the references disclose "a substantially flat porous sheet disposed between the top surface of the vacuum table and the transport belt and in contact upon the substantially flat top surface of the vacuum table" and "wherein the porous sheet continuously restricts fluid flow between the table and the transport belt, such that the vacuum level provided by the vacuum table does not have to be readjusted as an area of the transport belt covered by the substrate varies."

As explained above, Wotton does not teach this limitation either expressly or inherently. Furthermore, a brief reading of Ju and Yraceburu show that neither of the references teaches the limitation. Finally, the Examiner's rejections based on Official Notice may not

be maintained. The Examiner has taken Official Notice that providing a vacuum source with a motor, a vacuum sensor and CPU to provide a consistent vacuum level in a printing system is obvious. The Applicant does not agree with the Examiner's conclusion and reserves the right to later provide arguments explaining why the conclusion is in error. However, even if the Examiner's conclusion were correct, the rejection could not properly be maintained since the Examiner has not shown that all of the claim limitations are present in the cited art. Again, none of the references, nor the Examiner's Official Notice teaches "a substantially flat porous sheet disposed between the top surface of the vacuum table and the transport belt and in contact upon the substantially flat top surface of the vacuum table" and "wherein the porous sheet continuously restricts fluid flow between the table and the transport belt, such that the vacuum level provided by the vacuum table does not have to be readjusted as an area of the transport belt covered by the substrate varies."

For at least these reasons, the Examiner's conclusion that the Applicant's claimed invention is obvious in light of the prior art on record is in error.

CONCLUSION

In view of the foregoing, the Applicant believes that the Examiner has failed to present a prima facie showing of anticipation or obviousness with regard to the claims of record. As noted in detail above, the Examiner has failed to find teachings of each and every element of the claimed invention in a single reference or even in a hypothetical combination of references. For these reasons the Applicant believes that the application is deemed to be in allowable condition.

Should the Examiner have any questions regarding the application, he is respectfully urged to contact Applicant's attorney at (650) 474-8400.

Respectfully submitted,



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